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10 CFR 50.73

February 9, 2004

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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Dresden Nuclear Power Station, Unit 2
Facility Operating License No. DRP-19
<u>NRC Docket No. 50-237</u>

Subject: Licensee Event Report 2003-007-00, "Unit 2 Manual Scram Due To High Stator Water Cooling System Temperature."

Enclosed is Licensee Event Report 2003-007-00, "Unit 2 Manual Scram Due To High Stator Water Cooling System Temperature," for Dresden Nuclear Power Station. This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section."

Should you have any questions concerning this report, please contact Jeff Hansen, Regulatory Assurance Manager, at (815) 416-2800.

Respectfully,

Danny G. Bost
Site Vice President
Dresden Nuclear Power Station

Enclosure

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station

IE22

NRC FORM 366 (7-2001)	U.S. NUCLEAR REGULATORY COMMISSION	APPROVED BY OBM NO. 3150-0104 EXP 7-31-2004
LICENSEE EVENT REPORT (LER)		Estimated burden per response to comply with this mandatory information collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records Management Branch (T-6 E6), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by internet e-mail to bjs1@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202 (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

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4. TITLE Unit 2 Manual Scram Due To High Stator Water Cooling System Temperature

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MO	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO	MO	DAY	YEAR	FACILITY NAME: N/A	DOCKET NUMBER: N/A
12	11	2003	2003	– 007 –	00	02	09	2004	FACILITY NAME: N/A	DOCKET NUMBER: N/A

9. OPERATING MODE	1
10. POWER LEVEL	096

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)

	20.2201(b)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(B)		50.73(a)(2)(ix)(A)
	20.2201(d)		20.2203(a)(4)		50.73(a)(2)(iii)		50.73(a)(2)(x)
	20.2203(a)(1)		50.36(c)(1)(i)(A)	X	50.73(a)(2)(iv)(A)		73.71(a)(4)
	20.2203(a)(2)(i)		50.36(c)(1)(ii)(A)		50.73(a)(2)(v)(A)		73.71(a)(5)
	20.2203(a)(2)(ii)		50.36(c)(2)		50.73(a)(2)(v)(B)		OTHER Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iii)		50.46(a)(3)(ii)		50.73(a)(2)(v)(C)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(D)		
	20.2203(a)(2)(v)		50.73(a)(2)(i)(B)		50.73(a)(2)(vii)		
	20.2203(a)(2)(vi)		50.73(a)(2)(i)(C)		50.73(a)(2)(viii)(A)		
	20.2203(a)(3)(i)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(B)		

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
George Papanic Jr.	(815) 416-2815

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
D	TJ	TIC	F180	Y					

14. SUPPLEMENTAL REPORT EXPECTED			15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

16. ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

On December 11, 2003, at 2335 hours (CST), with Unit 2 at 96 percent power in Mode 1, a manual scram was inserted as the result of the plant's response to high Stator Water Cooling System temperature. The high Stator Cooling Water System temperature was due to a failed temperature controller to the Stator Water Cooling System temperature control valve. The plant responded as expected to the manual scram.

The root cause of the temperature controller failure was attributed to historical foreign material intrusion resulting from inadequate processes for maintenance on the instrument air system. The foreign material caused an internal temperature controller pneumatic relay valve to stick and not respond properly. The identified foreign material was 5 to 10 micron aluminum oxide particles from the instrument air system. The corrective actions to prevent reoccurrence are to establish requirements for a post maintenance flush of instrument air lines and to incorporate the requirements into maintenance work planning documents.

The safety significance of this event was minimal. All control rods fully inserted and all systems responded as expected to the manual scram. There were no subsequent major equipment malfunctions.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

Dresden Nuclear Power Station Unit 2 is a General Electric Company Boiling Water Reactor with a licensed maximum power level of 2957 megawatts thermal. The Energy Industry Identification System codes used in the text are identified as [XX].

A. Plant Conditions Prior to Event:

Unit: 02 Event Date: 12-11-2003 Event Time: 2335 CST
Reactor Mode: 1 Mode Name: Power Operation Power Level: 96 percent
Reactor Coolant System Pressure: 1000 psig

B. Description of Event:

The Stator Water Cooling System (SWC) [TJ] at Dresden Nuclear Power Station, Unit 2, is used to cool the Stator of the Main Turbine Generator [TB]. The temperature of the SWC is controlled by an air operated temperature control valve (TCV) [V] that is equipped with a temperature controller, TIC-2-7400-23CS88. The TCV controls the SWC temperature by adjusting the SWC coolant that bypasses the SWC coolers. The valve opens with low SWC temperatures allowing the coolant to bypass the SWC coolers and closed with high SWC temperatures. The setpoint of the TCV temperature controller is 40 degrees Celsius (°C). Additionally, the Main Turbine Generator is equipped with a run-back feature that will automatically reduce the generator load if the SWC temperature exceeds 83 °C.

On October 17, 2003, during refueling outage D2R18, the SWC TCV temperature controller was replaced and satisfactorily aligned in accordance with vendor manual instructions. Additionally, a work order (WO) was tracking the need to make final adjustments to the controller after D2R18 when the Main Turbine Generator was operating. This was initially scheduled to occur on November 3, 2003, however, D2R18 was still in progress and it was rescheduled for November 13, 2003. On November 13, 2003, with Unit 2 operating, the WO was not completed and the work was not properly rescheduled during the turnover of incomplete outage work to the normal on-line work management organization.

On October 26, 2003, work was performed which installed a new tee into the Instrument Air System (IA) [LD]. The new tee was approximately 6 feet upstream of the SWC TCV temperature controller's air supply line. The maintenance involved isolating the air supply to the ½ inch air line, cutting into the IA line, brazing of the new tee and returning the air supply to service. The instruments down stream of the new tee were not isolated during the maintenance and no flushing of the air header was performed after the maintenance was completed.

On December 11, 2003, at 1900 hours (CST), it was discovered by an operator during rounds, that the Unit 2 SWC temperature was indicated as 29 °C and the SWC TCV was approximately 20 percent open. The TCV should have been approximately full open with a SWC temperature of 29 °C. During subsequent inspections, it was discovered that control air was leaking from the TCV temperature controller, causing the TCV to not properly control the SWC temperature. A judgment was made by the shift manager that the SWC TCV temperature controller had failed, adequate Main Turbine Generator cooling was maintained and no immediate action was required for Main Turbine Generator protection. Plant staff was dispatched to locate repair parts.

On December 11, 2003, at approximately 2334 hours (CST), the SWC temperature exceeded 83 °C and an automatic Main Turbine Generator run-back was initiated. On December 11, 2003, at 2335 hours (CST), a manual scram was inserted by a control room operator in accordance with Procedure DOA 7400-01, "Failure of the Stator Coolant System." The procedure requires a manual scram if the steam bypassing the Main Turbine during the run-back exceeds the capacity of 8½ Main Turbine bypass valves. The plant responded as expected to the manual scram; all controls rods inserted, and Group 2 and 3 containment isolation valves closed.

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17. NARRATIVE (If more space is required, use additional copies of NRC Form 366A)

An Emergency Notification System (ENS) call was made on December 12, 2003, at 0025 hours (CST) for the above-described event. The assigned ENS event number was 40388.

The SWC TCV controller was replaced and Unit 2 was synchronized to the grid on December 13, 2003, at 1148 hours (CST).

This event is being reported in accordance with 10 CFR 50.73(a)(2)(iv)(A), "Any event or condition that resulted in manual or automatic actuation of any of the systems listed in paragraph (a)(2)(iv)(B) of this section." The manual actuation of the reactor protection system and the automatic isolation of the containment isolation valves are listed in 10 CFR 50.73(a)(2)(iv)(B).

C. Cause of Event:

The root cause of the temperature controller failure was attributed to historical foreign material intrusion resulting from inadequate processes for maintenance on the IA.

The SWC TCV temperature controller had been satisfactorily benched tested prior to installation. The bench testing included a calibration and an operational test in accordance with the vendor manual. Reviews of the post D2R18 SWC temperature trends indicate that the temperature controller was performing erratically from the initial stages of the startup from D2R18 until it failed. The erratic SWC temperature was not immediately detected as this parameter is not required to be observed during operator rounds.

The failed SWC TCV temperature controller was sent to the Foxboro Company (Foxboro), the original equipment manufacturer, to perform an evaluation. The evaluation concluded that the temperature controller failure was attributed to internal foreign material that caused an internal pneumatic relay valve to stick and not respond properly. This failure would cause the temperature controller output to be erratic. Exelon PowerLabs West performed a detailed material analysis of the internal material. The test results identified two predominate materials, silicone and aluminum oxide. The aluminum oxide was determined to be on average 5 to 10 microns in size.

The material analysis did not find any foreign material that could be directly attributed to the installation processes associated with the new tee in the IA header (i.e., copper from cutting/grinding the air line or silver from the brazing process). Thus, the foreign material exclusion practices performed by the personnel during the installation of the tee were satisfactory and did not contribute to the failure of the temperature controller.

The source of the silicone material identified was attributed to the new temperature controller. Foxboro identified that silicone oil is used during the assembly of the rubber parts within the temperature controller and the initial use of the temperature controller would have spread this oil to other internal components within the controller. The source of the aluminum oxide was the desiccant used in the Unit 2 IA's dryers. The system has a pre-filter and post filter that are designed to prevent desiccant particles greater than 0.9-microns from passing into the air system. The IA is sampled quarterly and the results for September 2003 and December 2003 were below the 3-micron acceptance limit. However, if larger than 0.9-micron desiccant particles had penetrated the air system's filters in the past, some of the desiccant would have plated out on the walls of the IA piping. This poses no threat to operating equipment unless the IA piping is disturbed causing the desiccant to break free from the piping walls and travel to a new location.

The effects of the installation of the tee approximately 6 feet upstream of the SWC TCV temperature controller's air supply were sufficient to have caused plated out desiccant to break free. The combination of the initial spreading of the silicone oil and the relocating 5 to 10 micron desiccant particles resulted in creating a temporary internal air environment within the temperature controller that caused the controller to fail. This internal air environment would not have been created if the relocating 5 to 10 micron desiccant particles had been removed from the air header by a post maintenance flush.

A review of the need to manually scram Unit 2 was performed including recreating this event on the Dresden simulator. The review concluded that reactor power could not have been reduced fast enough to prevent the need to manually scram the reactor during the Main Turbine Generator run-back.

D. **Safety Analysis:**

The safety significance of this event was minimal. All control rods fully inserted and all systems responded as expected to the manual scram. There were no subsequent major equipment malfunctions. Therefore, the consequences of this event had minimal impact on the health and safety of the public and reactor safety.

E. **Corrective Actions:**

The SWC TCV controller was replaced.

The Outage Control Center disbandment checklist will be revised to provide requirements for the reassignment of responsibility for the completion of incomplete outage work items.

The Non-Licensed Operator (NLO) rounds will be revised to include the monitoring of the SWC temperature operating band.

Engineering will review and identify the critical parameters that require monitoring during NLO and control room rounds.

Requirements for a post maintenance flush of IA lines will be established.

Maintenance work planning documents will be revised to include requirements for a post maintenance flush of IA lines.

F. **Previous Occurrences:**

A review of Dresden Nuclear Power Station Licensee Event Reports (LERs) and operating experience over the previous five years did not find any similar SWC or IA occurrences.

G. **Component Failure Data:**

Foxboro Model/Part Number 43AP-PA52N/TA-1A